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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/535,158	03/24/2000	Katsuhiro Aoki	0557-49331-2	1887

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EXAMINER

GRAINGER, QUANA MASHELL

ART UNIT PAPER NUMBER

2852

DATE MAILED: 08/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/535,158

Applicant(s)

FUJISHIRO ET AL.

Examiner

Quana Grainger

Art Unit

2852

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2002 .
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1-2, 15-16, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono in view of the admitted prior art of record.

Ono teaches comprises a latent image bearing member 100 having a photoconductive surface with a latent image including image areas, at least some of said image areas having different image potential values thereon; and a developing device 140 configured to perform a developing operation with a one-component developer including toner particles, the developing device including, a conveyor member 102 configured to convey the one-component developer from a one-

component developer supply and to deliver the one-component developer with a predetermined amount of charge to a developing region where a conveyor surface portion of the conveyor member is closely spaced from and opposed to a photoconductive surface portion of the latent image bearing member 100, a thin layer forming device (blade shown in Figure 1) configured to form the one-component developer being conveyed on the conveyor member into a uniform thin layer prior to the one-component developer with the predetermined amount of charge being delivered to the developing region, and a voltage source (not shown) configured to apply a developing bias voltage to the conveyor member when the developing operation is performed to move at least some of the one-component developer with a predetermined charge adhering to the conveyor surface portion to the photoconductive surface portion to form saturated amounts of the one-component developer on the image areas of the photoconductive surface portion, wherein the saturated amounts do not change with increases of the image potential above a predetermined threshold value to provide an image having a density determined by the saturated amounts. The amount of the one component developer adhering to the conveyor surface portion is about 0.5 mg/cm² (abstract). Ono also teaches an image forming apparatus but does not teach two level developing.

The admitted prior art of record teaches a two level developing method and that this method is conventional and known in the art (specification: page 1, lines 12-18). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the teaching of Ono with an image forming device using a developing

method such as taught by the admitted prior art of record to obtain high grade images without fogging (purpose: lines 1-5).

2. Claims 1, 3, 5, 7, 12, 14-15, 17, 19, 21, 26, and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. in view of the admitted prior art of record.

Shin et al. teaches a latent image bearing member 5 having a photoconductive surface with a latent image including image areas; and a developing device (Figures 5-7), the developing device including, a conveyor member 1 configured to convey the one-component developer from a one-component developer supply and to deliver the one-component developer with a predetermined amount of charge to a developing region where a conveyor surface portion of the conveyor member is closely spaced from and opposed to a photoconductive surface portion of the latent image bearing member 5, a thin layer forming device 4a configured to form the one-component developer being conveyed on the conveyor member into a uniform thin layer prior to the one-component developer with the predetermined amount of charge being delivered to the developing region, and a voltage source 8 configured to apply a developing bias voltage to the conveyor member when the developing operation is performed to move at least some of the one-component developer with a predetermined charge adhering to the conveyor surface portion to the photoconductive surface portion to form saturated amounts of the one-component developer on the image areas of the photoconductive surface portion, wherein the saturated amounts do not change with increases of the

image potential above a predetermined threshold value to provide an image having a density determined by the saturated amounts. The development region includes a gap between the conveyor surface portion and the opposed photoconductive surface portion that is equal to or less than about 150 micron (column 5, lines 61-63).

Shin et al. also teaches an image forming apparatus comprising means for bearing a latent image including image areas and means for applying a developing bias voltage 8 to the means for conveying when the developing operation is performed to move at least some of the one component developer with a predetermined charge adhering to the portion of the means for conveying to the portion of the means for bearing a latent image to form saturated amounts of the one-component developer on the image areas of the portion of the means for bearing a latent image, wherein the saturated amounts do not change with increases of the image potential above a predetermined threshold value to provide an image having a density determined by the saturated amounts. The thin layer forming device 4a configured to form the one-component developer on the conveyor member 1 into a uniform thin layer having a height corresponding to 1 to 1.5 times a diameter of the toner particles of the one-component developer (column 5, lines 27-30). Shin et al. does not teach a two level developing method.

The admitted prior art of record teaches that a two level developing method is conventional (specification: page 1, lines 12-18). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the teaching of Shin et al. with an image forming device using a developing method such as taught by

the admitted prior art of record to obtain desirable images having both solid and line quality (column 4, lines 10-14). As to the developer charge, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the appropriate values for the predetermined amount of charge of the one-component developer, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

3. Claims 4, 6, 8-11, 13, 18, 20, 22-25, and 27, are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. in view of the admitted prior art of record and further in view of Kinoshita. Shin et al. teaches a developing bias having a superimposed AC voltage 8; and a thin layer forming device 4a in pressure contact with the developer-bearing member that protrudes from the holder (Figures 5-7).

Shin et al. does not teach an image forming apparatus wherein substantially all of the one-component developer on the conveyor surface portion is moved during the forming of the saturated amounts; the developing bias voltage applied to the conveyor member by the voltage source is an AC voltage superimposed on a DC voltage, said AC voltage having a peak-to-peak voltage value from 600 to 1200 volts and a frequency from 2 to 6 kHz; that the thin layer forming device protrudes from a holder with a protruding length of 10 to 15 mm; the thin layer forming device contacts the developer-bearing member with a contact pressure of about 10 to about 150 g/cm; nor a surface roughness of the conveyor member is set from about 1 to about 4 micron RZ.

Kinoshita teaches a conveying member having a surface roughness (column 8, lines 1-9) and a thin layer forming device contacts the developer-bearing member with a contact pressure of about 10 to about 150 g/cm (column 6, line 65 - column 7, line 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the teaching of shin et al. with the image forming device of Kinoshita to obtain a developing apparatus which provides a desirable image for both solid and line images (column 4, lines 10-14).

As discussed above, Shin et al. does not teach the claimed developing bias and Shin et al. in view of Kinoshita does not state the claimed surface roughness for the thin layer forming device. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the appropriate values for these components, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Response to Arguments

4. Applicant's arguments filed 5-31-02 have been fully considered but they are not persuasive. Applicant argues that the admitted prior art of record concerning teach two-level developing refers to what was known in Japan. However, applicant discusses that two level development has been used in recent years in image forming devices using digital image data on page 1 of the specification. These type of image forming devices are used in this country and thus this information is also known in this country.

Applicant argues that Ono does not teach a voltage source that applies a development bias voltage. However, it is well known in the art that in order to move the toner image from the photoconductive surface to the recording medium, a voltage is used. As to the teachings of the applied references, consider the following. Both Ono and Shin teach gap development developing devices. These type of developing devices use a developing bias to cause the developer to move from the developer bearing member to the photoconductive surface. The portion of the developer on the developer bearing member that moves to the photoconductive member is based on the control of the variables that affect the developing process. These variables include the charge of the developer, the developing bias, the charge of the latent image and the non-image region on the photoconductive member, as well as environmental variables. In the claims, applicant recites that a saturated amount of developer is moved to the photoconductive surface and that this amount does not change with an increasing bias above a predetermined threshold. In any developing device, this predetermined threshold may exist, especially if all the developer on the developer bearing member is moved to the photoconductive surface.

Applicant also argues that the cited references do not teach transferring saturated amount of toner to the photoconductive surface. However, Ono teaches that the 0.5 mg/cm² adheres to the developer bearing member, which is moved to the photoconductive surface .

The claims remain rejected as discussed above. The examiner invites applicant to request an interview if applicant desires.

Prior Art of Record

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kim et al. teaches two-level gap developing device.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quana Grainger whose telephone number is 703-308-7616. The examiner can normally be reached on weekdays between the hours of 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Arthur Grimley can be reached on 703-308-1373. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Art Unit: 2852

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.



Quana Grainger
Primary Examiner
Art Unit 2852

QG
August 12, 2002